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References are in agreement with UMRL dated October 2007

Revised throughout - changes not indicated by CHG tags

SECTION 01 57 23.00 55

STORM WATER POLLUTION PREVENTION MEASURES 10/07

NOTES: This guide specification covers the requirements for temporary construction measures most used in complying with the Best Management Practices of the storm water pollution prevention plan as required by a NPDES Permit.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the

Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4439	(2004) Geosynthetics
ASTM D 4491	(1999a; R 2004e1) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(2004) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 2003) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(2004) Determining Apparent Opening Size of a Geotextile
ASTM D 4873	(2002) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.2 GENERAL

Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of Section 01 57 20.00 55 ENVIRONMENTAL PROTECTION, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit attached to that Section, or applicable St. John's River Water Management Environmental Resource Permit.

1.3 SUBMITTALS

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES in sufficient detail to show full compliance with the specification:

SD-07 Certificates

Mill Certificate or Affidavit

Certificate attesting that the Contractor has met all specified requirements.

Evidence of Submittal of [Notice of Intent \(NOI\)](#)

[Inspection Reports](#)

[NOI and letter from FDEP](#)

[1.4 STORMWATER DISCHARGE PERMITTING

NOTE: Construction activities resulting in disturbance of one (1) or more acre of total area requires execution and submission of a National Pollution Discharge Elimination System (NPDES) - Stormwater Program Notice of Intent (NOI) and use of the Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

It shall be the Contractor's responsibility to prepare and submit to the Florida Department of Environmental Protection (FDEP) a National Pollution Discharge Elimination System (NPDES) - Stormwater Program [Notice of Intent \(NOI\)](#) along with all accompanying fees. Submission shall include Contractor prepared construction Stormwater Pollution Prevention Plan (SWPPP) addressing the construction project. FDEP forms, fee schedule and instructions may be obtained through the State of Florida internet web site www.dep.state.fl.us/water/stormwater/npdes.

Contractor shall maintain compliance with the NPDES - NOI, including maintaining implemented Best Management Practices (BMP's) and NOI prescribed documentation. A copy of the [NOI and letter from FDEP](#) confirming coverage under this generic permit shall be submitted to 45 SW/CEV and shall be posted at the construction site in a prominent place for public viewing.

]1.5 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.5.1 Stabilization Practices

NOTE: Describe interim stabilization practices, including site-specific scheduling of the implementation of the practices. Plans should ensure that existing vegetation is preserved where attainable and disturbed areas are stabilized. Show locations for stabilization practices on the drawings.

The stabilization practices to be implemented shall include [temporary seeding,] [mulching,] [geotextiles,] [sod stabilization,] [vegetative buffer strips,] [erosion control matts,] [protection of trees,] [preservation of mature vegetation,] [etc]. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur, (e.g., [clearing] [and grubbing,] [excavation,] [embankment,] [and]

[grading]); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

Except as provided in paragraphs UNSUITABLE CONDITIONS and NO ACTIVITY FOR LESS THAN 21 DAYS, stabilization practices shall be initiated as soon as practicable, but no more than 14 days after, in any portion of the site where construction activities have [temporarily or] permanently ceased. In the case of a multi-phased project of ground disturbances, each phase will be stabilized as soon as practicable but no more than 14 days after ground disturbing activity in that portion of the site where construction activities have [temporarily or permanently] ceased. Where the requirements stipulated in the SWPPP (or SJRWMD permit) differ, those requirements take precedence over these.

1.5.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity [temporarily or] permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

1.5.1.2 No Activity for Less Than 21 Days

Where construction activity will resume on a portion of the site within 21 days from when activities ceased (e.g., the total time period that construction activity is temporarily ceased is less than 21 days), then stabilization practices do not have to be initiated on that portion of the site by the fourteenth day after construction activity temporarily ceased.

1.5.2 Structural Practices

NOTES: Describe structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. A permit under Section 404 of the Clean Water Act may be required for certain structural practices. Check with 45 CES/CEVC for requirements.

For common drainage locations that serve a disturbed area of 4 or more hectares (10 or more acres) at one time, a temporary or permanent detention basin providing 252 cubic meters of storage per hectare (3,600 cubic feet of storage per acre) drained, or equivalent control measures, shall be provided where attainable until stabilization of the site. Special care must be taken if constructed storm water ponds are used as temporary construction sediment basins to ensure complete removal of cause premature clogging. If possible, initially excavate the sediment basin bottom 6 inches to 12 inches (15-30 cm) higher than the eventual pond bottom. Once the system is sufficiently stabilized, the pond may then have the accumulated trapped sediments removed and excavated to design depths. The 252 cubic meters of storage per hectare (3,600 cubic feet of storage per acre) drained does not apply to flows from offsite areas and flows from onsite areas that are either

undisturbed or have undergone final stabilization where such flows are diverted around the sediment basin.

For drainage locations which serve a disturbed area of 4 or more hectares (10 or more acres) at one time and where a temporary sediment basin providing 252 cubic meters of storage per hectare (3,600 cubic feet of storage per acre) drained, or equivalent sediment controls, is not attainable, sediment controls are required for all sideslope and downslope boundaries of the construction area.

For drainage locations serving less than 4 hectares (10 acres), sediment traps, silt fences, or equivalent sediment controls are required for all sideslope and downslope boundaries of the construction area unless a sediment basin providing storage for 252 cubic meters of storage per hectare (3,600 cubic feet of storage per acre) drained is provided.

Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include the following devices. [Location and details of installation and construction are shown on the drawings.] These drawings will be updated in the field to reflect modifications made to the sediment and erosion control plan.

NOTE: Listed are examples of typical structural devices. Requirements for Silt Fences, Straw Bales, and Diversion Dikes are contained within this Guide Specification. Specifications for other structural practices used in the project must be added to this section.

- a. [Silt fences.]
- b. [Straw bales.]
- c. [Diversion dikes.]
- d. [Drainage swales.]
- e. [Check dams.]
- f. [Subsurface drains.]
- g. [Pipe Slope drains.]
- h. [Level spreaders.]
- i. [Storm drain inlet protection.]
- j. [Rock outlet protection.]
- k. [Sediment traps.]
- l. [Reinforced soil retaining systems.]
- m. [Gabions.]
- n. [Sediment basins.]
- o. [_____].

The permanent stabilization practices which are to be installed under the contract should be specified

in other section of the specifications. These are measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the Clean Water Act.

A goal of 80 percent removal of total suspended solids from these flows which exceed predevelopment levels should be used in designing and installing storm water management controls (where practicable). Where this goal is not met, the permittee shall provide justification for rejecting each practice listed above based on site conditions.

Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected.

[1.5.2.1 Silt Fences

Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment before commencing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings. Final removal of silt fence barriers shall be upon approval by the Contracting Officer.

] [1.5.2.2 Straw Bales

Contractor shall provide bales of straw as a temporary structural practice to minimize erosion and sediment runoff. Bales shall be properly placed to effectively retain sediment immediately after completing each phase of work (e.g., clearing and grubbing, excavation, embankment, and grading) in each independent runoff area (e.g., after clearing and grubbing in a area between a ridge and drain, bales shall be placed as work progresses, bales shall be removed/replaced/relocated as needed for work to progress in the drainage area). Areas where straw bales are to be used are shown on the drawings. Final removal of straw bale barriers shall be upon approval by the Contracting Officer. Rows of bales of straw shall be provided as follows:

- a. Along the downhill perimeter edge of all areas disturbed.
- b. Along the top of the slope or top bank of drainage ditches, channels, swales, etc. that traverse disturbed areas.
- c. Along the toe of all cut slopes and fill slopes of the construction areas.

NOTE: Space rows a maximum of 60 meters (200 feet) apart in drains with slopes equal to or less than 5 percent and 30 meters (100 feet) apart in drains with slopes steeper than 5 percent. If drainage ditches have slopes above and below the 5 percent limit the spacing should be shown on the drawings.

- d. Perpendicular to the flow in the bottom of existing drainage ditches, channels, swales, etc. that traverse disturbed areas or carry runoff from disturbed areas. Rows shall be spaced [a maximum of [_____] meters feet apart] [as shown on the drawings].
- e. Perpendicular to the flow in the bottom of new drainage ditches, channels, and swales. Rows shall be spaced [a maximum of [_____] m feet apart] [as shown on the drawings].
- f. At the entrance to culverts that receive runoff from disturbed areas.
- g. [_____] .

] [1.5.2.3 Diversion Dikes

Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 0.5 m 18 inches. The minimum base width shall be 1.8 m 6 feet and the minimum top width shall be 0.6 m. 2 feet. Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic. Diversion dikes shall be located as shown on the contract drawings and/or SWPPP.

] PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of -18 to 49 degrees C 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile	ASTM D 4632	445 N min.
Elongation (%)		30 % max.
Trapezoid Tear	ASTM D 4533	245 N min.

FILTER FABRIC FOR SILT SCREEN FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Permittivity	ASTM D 4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

FILTER FABRIC FOR SILT SCREEN FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Elongation (%)	ASTM D 4632	100 lbs. min. 30 % max.
Trapezoid Tear	ASTM D 4533	55 lbs. min.
Permittivity	ASTM D 4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

2.1.2 Silt Fence Stakes and Posts

Contractor may use wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 50 mm by 50 mm 2 inches by 2 inches when wood is used, and shall have a minimum length of 1.5 m 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum mass of 1.98 kg per linear meter weight of 1.33 pounds per linear foot and a minimum length of 1.5 m 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.

2.1.4 Identification Storage and Handling

Filter fabric shall be identified, stored and handled in accordance with ASTM D 4873.

2.2 COMPONENTS FOR STRAW BALES

The straw in the bales shall be stalks from oats, wheat, rye, barley, rice, or from grasses such as byhalia, bermuda, etc., furnished in air dry condition. The bales shall have a standard cross section of 350 mm by 450 mm 14 inches by 18 inches. All bales shall be either wire-bound or string-tied. Contractor may use either wooden stakes or steel posts to secure the straw bales to the ground. Wooden stakes utilized for this purpose, shall have a minimum dimensions of 50 mm by 50 mm 2 inches x 2 inches in cross section and shall have a minimum length of 1 m 3 feet. Steel posts (standard "U" or "T" section) utilized for securing straw bales, shall have a minimum mass of 1.98 kg per linear meter weight of 1.33

pounds per linear foot and a minimum length of 1 m 3 feet.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 400 mm 16 inches above the ground surface and shall not exceed 860 mm 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, place the end post of second fence inside the end post of the first fence. Rotate both filter fabrics 720 degrees and drive both posts into ground and bury the bottom edge. A trench shall be excavated approximately 100 mm 4 inches wide and 100 mm 4 inches deep on the upslope side of the location of the silt fence. The 100 mm by 100 mm 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 INSTALLATION OF STRAW BALES

Straw bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 100 mm. 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 100 mm 4 inches against the uphill side of the barrier. Loose straw shall be scattered over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Each bale shall be securely anchored by at least two stakes driven through the bale. The first stake or steel post in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or steel pickets shall be driven a minimum 450 mm 18 inches deep into the ground to securely anchor the bales.

3.3 MAINTENANCE

NOTE: Describe the procedures to be follow during construction to maintain the vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition.

Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.3.1 Silt Fence Maintenance

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid

to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall receive erosion control if required.

3.3.2 Straw Bale Maintenance

Straw bale barriers shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits shall be removed when deposits reach one-half of the height of the barrier. Bale rows used to retain sediment shall be turned uphill at each end of each row. When a straw bale barrier is no longer required, it shall be removed. The immediate area occupied by the bales and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with [the contract drawings].

3.3.3 Diversion Dike Maintenance

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with [the contract drawings].

3.4 INSPECTIONS

3.4.1 General

Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 13 mm 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.4.2 Inspections Details

Disturbed areas [and areas used for material storage that are exposed to precipitation] shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.4.3 Inspection Reports

For each inspection conducted, the Contractor shall immediately prepare a

report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer as a part of the Contractor's weekly construction report. A copy of the inspection report shall be maintained on the job site.

On the first working day of each month the Contractor shall submit inspection and maintenance report copies to the Contracting Officer.

-- End of Section --